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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,739	04/13/2004	Avik Sinha	MR2833-41	4611

4586 7590 07/03/2007  
ROSENBERG, KLEIN & LEE  
3458 ELLICOTT CENTER DRIVE-SUITE 101  
ELLICOTT CITY, MD 21043

EXAMINER
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RUTTEN, JAMES D

ART UNIT	PAPER NUMBER
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2192

MAIL DATE	DELIVERY MODE
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07/03/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/822,739

Applicant(s)

SINHA ET AL.

Examiner

J. Derek Rutten

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/16/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-22 have been examined.

#### *Claim Objections*

2. Claim 10 is objected to because of the following informalities: Line 8 (or line 2 on page 54) recites “in accordance a set union.” This appears to be a typo which should read --in accordance with a set union--. Appropriate correction is required.

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-8 and 10-21 are rejected under 35 U.S.C. 102(a) as being anticipated by “Enhanced Testing of Domain Specific Applications by Automatic Extraction of Axioms from Functional Specifications” by Sinha et al. (hereinafter “Sinha”).

In regard to claim 1, Sinha discloses:

*A method for testing operation of a system against a natural language design specification defining a closed set of behaviors thereof, the system being operationally specific to at least one problem domain, the method comprising the steps of:*

*translating the natural language specification to a specification in at least one description language specific to a corresponding one of the at least one problem domain, each of said at least one domain specific description language including a set of axioms, each of said set of axioms corresponding to a respective syntactical relationship between morphemes of said corresponding domain specific description language; See page 9, left column, third paragraph, e.g. “A HaskellDB specification of the application was prepared from the natural language specification...”*

*generating a model of the system from said domain specific description language specification, said model behaving in accordance with a first set of behaviors and a second set of behaviors, each of said first set of behaviors corresponding to a respective one of the closed set of behaviors and each of said second set of behaviors corresponding to a respective one of said set of axioms; See page 9, left column, third paragraph, e.g. “...a test model was developed automatically from [the specification]...” Also see pages 3-4, section 4.2 “HaskellDB Axioms and Domain Specific Requirements.”*

*generating from said model a test case for each behavior of a set union of said first set of behaviors and said second set of behaviors; and See page 9, left column last paragraph, e.g. “test cases were generated...for the automatically generated test model.”*

*providing to the system every test case generated from said model as the set of test cases for testing the system operation. See page 9 bottom of left column to top of right column, e.g. “test cases were executed on the application.”*

In regard to claim 2, the above rejection of claim 1 is incorporated. Sinha further discloses: *whereby said model includes an extended finite state machine*. See page 2, left column, paragraph 4.

In regard to claim 3, the above rejection of claim 2 is incorporated. Sinha further discloses: *whereby at least one state transition corresponding each of said axioms is embedded into said extended finite state machine*. See page 8, left column, section 5.2.3.

In regard to claim 4, the above rejection of claim 1 is incorporated. Sinha further discloses: *whereby each of said at least one domain specific description language is a respective domain specific computer programming language*. See page 1, right column, 2<sup>nd</sup> paragraph.

In regard to claim 5, the above rejection of claim 4 is incorporated. Sinha further discloses: *whereby each of said domain specific programming language is a respective functional language*. See page 2, left column, paragraph 2.

In regard to claim 6, the above rejection of claim 5 is incorporated. Sinha further discloses: *whereby said model generating step includes the steps of: reordering functions in said domain specific programming language specification; separating said functions into a first set of functions corresponding to functions native to said domain specific programming language and a second set of functions corresponding to functions foreign*

*to said domain programming specific language; generating an extended finite state machine from said second set of functions; and embedding into said extended finite state machine at least one state transition corresponding to each of said first set of functions.*

See sections 5.2.3 and 5.2.3 on pages 7-8.

In regard to claim 7, the above rejection of claim 6 is incorporated. Sinha further discloses: *whereby said functions are reordered in a temporal order of execution.* See Figure 2.

In regard to claim 8, the above rejection of claim 6 is incorporated. Sinha further discloses: *whereby said first set of functions includes recursion.* See page 6, footnote “2.”

In regard to claim 10, Sinha discloses:

*A method for testing a computing application specific to a computing domain comprising the steps of:*

*providing to a testing authority a natural language specification of the computing application defining a closed set of behaviors thereof;* See page 9, left column, paragraph 3, e.g. “we started with the natural language specifications.” Here, “we” is interpreted as providing a testing authority.

...

*communicating to said testing authority each of said set of test cases which results in a behavior of the application contrary to said corresponding one of said closed set of behaviors specified in said natural language specification. See page 9, right column, last paragraph, e.g. "The failures were analyzed further."*

All further limitations have been addressed in the above rejection of claim 1.

In regard to claims 11, 17-21, the above rejection of claim 10 is incorporated. All further limitations have been addressed in the above rejection of claims 5, 2 and 1, 3, and 6-8, respectively.

In regard to claim 12, the above rejection of claim 10 is incorporated. Sinha further discloses: *whereby all of said at least one domain specific language are derived from a common functional language. See section 3.3 on page 3.*

In regard to claim 13, the above rejection of claim 12 is incorporated. Sinha further discloses: *whereby said common functional language is Haskell. See section 3.3 on page 3.*

In regard to claim 14, the above rejection of claim 13 is incorporated. Sinha further discloses: *whereby one of said at least one domain specific language is HaskellDB. See section 3.3 on page 3.*

In regard to claim 15, the above rejection of claim 14 is incorporated. Sinha further discloses: *whereby one of said at least one domain specific language is TclHaskell*. See section 3.3 on page 3.

In regard to claim 16, the above rejection of claim 13 is incorporated. Sinha further discloses: *whereby one of said at least one domain specific language is TclHaskell*. See section 3.3 on page 3.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sinha as applied to claim 8 above, and further in view of U.S. Patent 5,343,554 to Koza et al. (hereinafter "Koza").

In regard to claim 9, the above rejection of claim 8 is incorporated. Sinha further discloses that recursion is addressed extensively (see footnote "2" on page 6). Sinha does not expressly disclose: *whereby a state transition is embedded into said extended finite state machine for each of a base case, a terminating case and one recursive step of said recursion function*. However, Koza teaches that recursion is addressed using a base case



and a terminating case as well as recursive step cases. See Abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Koza's teaching of recursion cases with Sinha's recursive calls in order to solve complex problems as suggested by Koza (see column 107 lines 19-31).

In regard to claim 22, the above rejection of claim 21 is incorporated. All further limitations have been addressed in the above rejection of claim 9.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Derek Rutten whose telephone number is (571)272-3703. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571)272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jdr



TUAN DAM  
SUPERVISORY PATENT EXAMINER